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(54) **FAST JPEG HUFFMAN ENCODING AND DECODING**

(75) **Inventors:** **Joan L. Mitchell**, Longmont, CO (US);
Albert N. Cazes, Mount Kisco, NY
 (US); **Neil M. Leeder**, Apex, NC (US)

(73) **Assignee:** **International Business Machines Corporation**, Armonk, NY (US)

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(58) **Field of Search** **341/51, 61, 106, 341/67, 79, 65; 358/427, 426, 433, 432; 382/199, 246, 232**

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,396,906 A * 8/1983 Weaver 341/65

5,227,789 A * 7/1993 Barry et al. 341/65
 5,550,541 A * 8/1996 Todd 341/51
 5,652,582 A * 7/1997 Truong et al. 341/65
 5,686,915 A * 11/1997 Nelson et al. 341/65
 5,808,570 A * 9/1998 Bakhmutsky 341/65
 6,040,790 A * 3/2000 Law 341/65
 6,130,630 A * 10/2000 Grohs et al. 341/51

* cited by examiner

Primary Examiner—Michael Tokar

Assistant Examiner—Lam T. Mai

(74) *Attorney, Agent, or Firm*—Whitham, Curtis & Christofferson, P.C.; William H. Steinberg

(57) **ABSTRACT**

Huffman encoding, particularly from a packed data format, is simplified by using two different table formats depending on code length. Huffman tables are also reduced in size thereby. Decoding is performed in reduced time by testing for the length of valid Huffman codes in a compressed data stream and using an offset corresponding to a test criterion yielding a particular test result to provide a direct index into Huffman table symbol values while greatly reducing the size of look-up tables used for such a purpose.

8 Claims, 16 Drawing Sheets

